

# Claims

- [c1] 1. A variable speed brushless DC motor comprising a rotor, a commutation circuit, and a stator module, said commutation circuit comprising a power circuit and a signal circuit, said power circuit comprising a stator winding power source, four commutation switches, and at least a speed-change switch, said signal circuit comprising a rotor position sensor circuit and a commutation logic circuit, said commutation switches being arranged into two commutation switch sets connected in parallel to said stator winding power source, said speed-change switch being installed in one said commutation switch set, said stator module being connected between said two commutation switch sets, said commutation logic circuit being adapted to connect and control on/off status of the four commutation switches of said power circuit,
- wherein said stator module comprises at least two stator windings; on/off status of said speed-change switch controls supply of electric current to said stator module to further selectively energize said at least two stator windings.

- [c2] 2. The variable speed brushless DC motor as claimed in claim 1, wherein said at least two stator windings are divided into two vertically spaced symmetric circuits when extended out horizontally by means of equivalent circuit, said two vertically spaced symmetric circuits being in balance and having the same phase.
- [c3] 3. The variable speed brushless DC motor as claimed in claim 1, wherein said speed-change switch is an electronic switch.
- [c4] 4. The variable speed brushless DC motor as claimed in claim 1, wherein said speed-change switch is a mechanical switch.
- [c5] 5. The variable speed brushless DC motor as claimed in claim 1, wherein said speed-change switch is a photoelectric switch.
- [c6] 6. The variable speed brushless DC motor as claimed in claim 1, wherein said rotor position sensor circuit is a photo encoder circuit.
- [c7] 7. The variable speed brushless DC motor as claimed in claim 1, wherein said rotor position sensor circuit is a Hall element circuit.
- [c8] 8. The variable speed brushless DC motor as claimed in

claim 1, wherein said commutation switch is a bipolar junction transistor switch.

[c9] 9.The variable speed brushless DC motor as claimed in claim 1, wherein said commutation switch is a field effect transistor switch.